Voluntary Marine Protected Areas and Adaptive Management in the San Juan Islands

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Abstract
Two types of voluntary Marine Protected Areas (MPAs) have been developed in San Juan County. The first type, designed to manage whale watching, is a mobile species-specific MPA that apples only when orcas are present. The second type of voluntary MPAs are Bottomfish Recovery Zones designated by San Juan County.

The integrity of an MPA depends upon compliance. In the San Juans most existing MPAs designated by top-down legislation haven't received adequate funding to monitor or enforce them. In contrast, the new voluntary MPAs are implemented through peer pressure and on-the water education programs.

A primary tenet of adaptive management is flexible management that is modified for changing conditions. Top-down MPAs require legal enactment and legislated funding for education, monitoring, enforcement and prosecution. If regulations prove to be ineffective, adjustments require further legislation. This inflexible process makes regulated MPAs impractical for applying adaptive management.

Because voluntary MPAs have no legal standing, local communities can propose them at any time. In terms of adaptive management, voluntary MPAs provide the flexibility required to adjust management strategies when needed and can do so with less cost and better compliance.

Extended Abstract

Adaptive Management
In *adaptive management* (Holling 1978; 1986; Walters 1986) the objectives are twofold: (1) improve the resource's resilience instead of managing for a prescribed stable condition and (2) maintain flexible management strategies that are modified depending on how the resource behaves. The first of these objectives, managing for ecological resilience, has now become a standard approach in modern resource management (Mitchell 1989; Allen and Hoekstra; 1992; Winterhalder 1994), but the second objective is rarely implemented due to the inertia of legal requirements associated with regulations and enforcement. Once regulations are put in place it is difficult to adjust them and management becomes unresponsive to the behavior of the system. Voluntary guidelines and best practices provide an alternative to regulations that can be more responsive to the behavior of the managed system with a potentially equivalent degree of compliance.

Regulatory Impediments to Adaptive Management
The regulatory approach to adaptive management (Figure 1) is usually top-down. A resource management issue is identified, either by science or public outcry, and legislation is enacted to regulate the issue. The regulations usually go through a public review process before being legislated, and are then implemented through enforcement by the appropriate governmental management division. Often the enforcement responsibility is legislated without additional funding for operations. In some cases this results in no enforcement; in most cases this results in low-priority enforcement by the governmental management division.

In situations where the new regulation is legally controversial, enforcement of individual cases can be held up in the courts for years. Injunctions can also be applied that suspend the regulation pending the outcome of legal decisions. Furthermore, in cases where new regulations are found to be ineffective or even

detrimental to resource management, it often takes going back to the legislative process to make the adjustment.

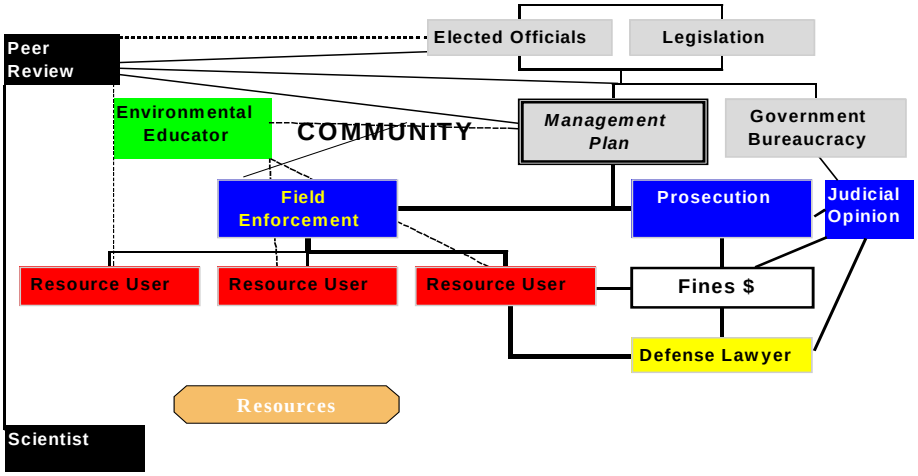

Figure 1 Regulatory Approach to Management.

Community-Based Voluntary Regulations and Adaptive Management

In contrast to the regulatory approach, the community-based voluntary approach to management is from the bottom up, where the resource users work with each other and concerned community organizations to implement voluntary best practices through education and peer pressure (Figure 2). With the voluntary approach the legal system is not involved and the role of government becomes advisory, ideally providing endorsement with matching funds.

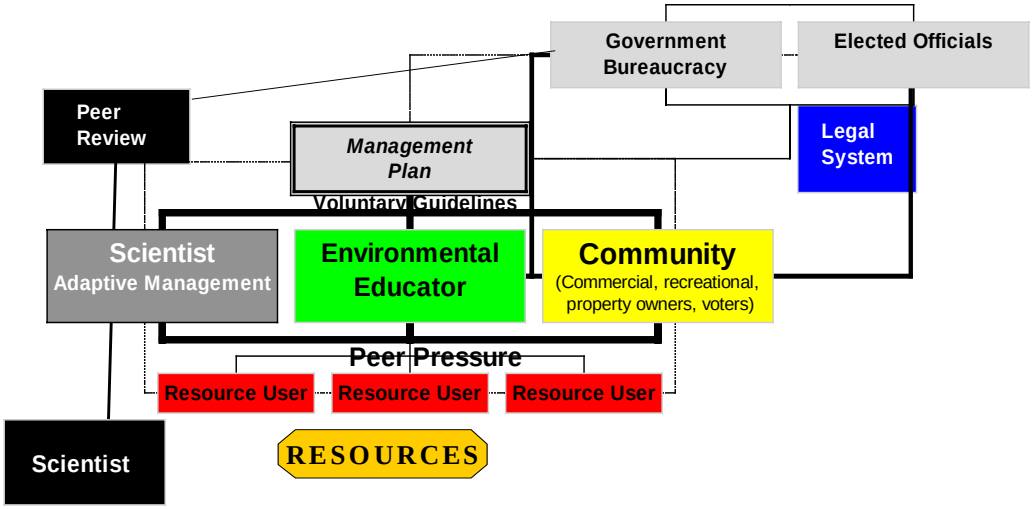

Figure 2 Community-based voluntary approach to management.

Examples from the San Juan Islands

In the boundary waters of the San Juan Islands three different types of voluntary Marine Protected Areas (MPAs) are in existence. These are mobile protected areas that exist only when whales are present (Osborne and Koski 1997; Osborne and others 1999; 2000), no-take zones for bottomfish (Kail, 2001) and federal wildlife reserves with guidelines for a 200-yard buffer (USFWS 1986; Osborne and others 1998). In none of these MPAs are violations of the guidelines prosecutable by law, they are instead implemented through education and peer pressure.

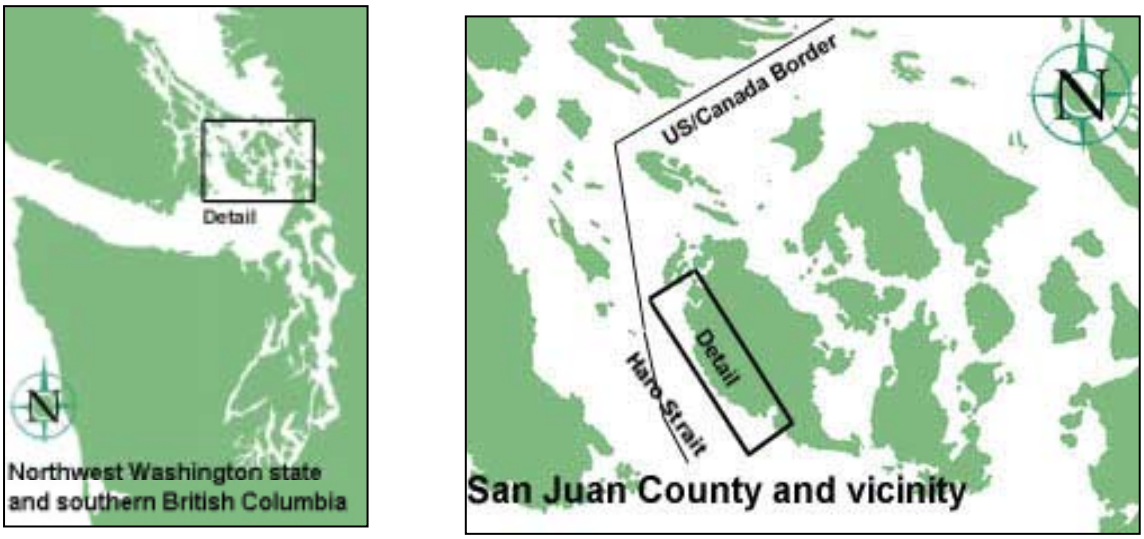

Figure 3 Map of the Study Area

Whale Watching Management in the Boundary Waters of Haro Strait

Over the last 12 years whale watching management in the boundary waters of Haro Strait has evolved a changing set of voluntary guidelines that are stricter than the mandated guidelines of both the U.S. and Canadian federal governments (Osborne and Koski 1997; Osborne and others 1999; 2000). These have developed as a result of community-based efforts from local non-governmental organizations working in conjunction with the commercial industry (Table 1).

Unlike typical MPAs, which normally are site specific, whale watching MPAs are mobile and exist around the whales as they move through the region. For geographically designated sites, the MPA exists only when whales are present (Figure 4). The key factor in the development of this process of community-based self regulation has been the operation of daily educational vessel patrols that distribute local guidelines to each recreational vessel engaged in whale watching (Figure 5), as well as collecting systematic field data on vessel and wildlife activity. The objectives of the educational program are to educate boaters before they leave the shore and to reinforce the learning experience in the context where disturbances take place. Supporting objectives include participation in the development of the community-based voluntary guidelines, and providing a scientific platform to help evaluate the successes and failures of guidelines.

This management model for the mobile MPAs used for whale watching is also applicable to adaptive management of more traditional site-specific MPAs. Two examples where this model is now in the early stages of implementation are the eight voluntary bottomfish no-take zones designated by San Juan County in 1998 (Kaill, 2001) and the 83 sites in the San Juan Islands National Wildlife Refuge System and Wilderness Areas (Osborne, and others 1998).

Table 1. Whale Watching Management in Haro Strai**t**

1988	The Whale Museum begins research and education on whale watching (industry surveys, public meetings, posters, and brochures).
1993	The Whale Museum initiates on-the water educational patrols and data collection as the *Soundwatch* program.
1994	International *Whale Watch Operators Association Northwest* (WWOANW) is formed with self-regulatory guidelines.
1994-Present	Soundwatch and WWOANW annually adjust and implement stricter voluntary guidelines
1999-Present	Increasing participation/support for voluntary guidelines from Canadian and U.S. federal agencies.
2000	Petition with 1,4000 signatures for stricter whale watching guidelines from San Juan County community submitted to Board of County Commissioners.
2001	San Juan County Marine Resources Committee recommends to the Board of County Commissioners to continue with community based voluntary guidelines for 2001.

Figure 4 Summer 2000 Map of Voluntary No Boat Zones for Whale Watching off San Juan Island

Figure 5 Soundwatch Boat passing out literature to a recreational boater.

San Juan County's Bottomfish Recovery Program

The San Juan County Bottomfish Recovery Program consists of 8 voluntary no-take areas. In March of 1996, the San Juan County Board of Commissioners, responding to public concern, identified a series of marine resource problems and appointed the Marine Resources Committee (MRC) to look into possible solutions (Kail 2001). Bottomfish recovery was identified as a top priority. In order to address this concern the MRC took testimony from scientists, resource managers, government specialists and others on bottomfish biology and management. The MRC also held public meetings on each of the major islands to identify sites that are now fished out, but were once very productive. From this input, eight sites were selected for protection to provide no-take areas where fish can grow to maturity and reproduce (Figure 6). Significant landmarks and signage indicating the extent of the zone are marked on the adjacent shoreline of each reserve. No-take refers to all marine life forms, with the exception of salmon. The zones all extend from the shoreline to 1/4 mile offshore.

It is important to note that this program depends largely on voluntary participation. It succeeds through the goodwill of fishers who realize the value of allowing spawners to survive in the protected areas. For a program of this nature to become a part of community culture, an intensive outreach and education effort is necessary for the region as well as on the water.

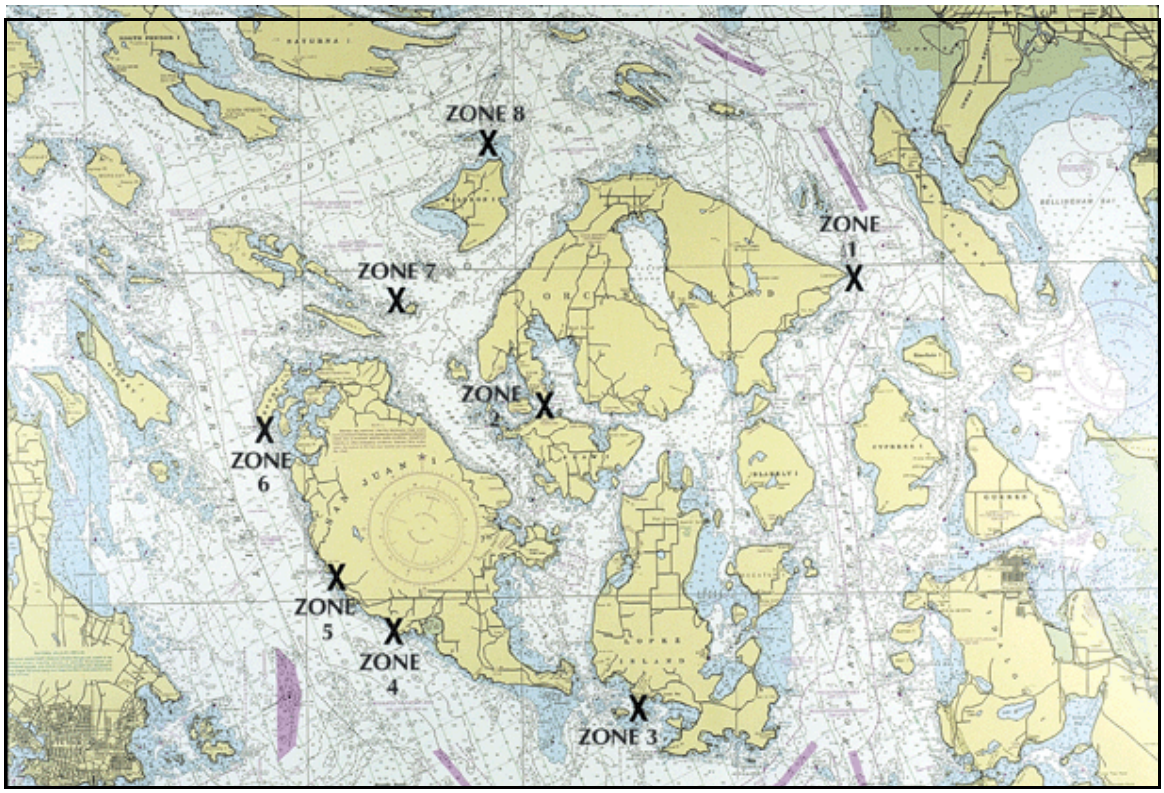

Figure 6. Bottom Fish Recovery Zones

USFWS, San Juan Islands National Wildlife Refuge and Wilderness Areas

Eighty-three reefs, rocks and islands in the San Juan archipelago have been set aside as The San Juan Islands National Wildlife Refuge System and Wilderness Areas. Part of the refuge network was first designated in 1914, with the present system in place since 1975 (USFWS 1986). The system is administered by the United States Fish and Wildlife Service under the Washington Maritime National Wildlife Refuge System in Port Angeles, Washington.

To protect wildlife, refuge areas are closed to public access and guidelines call for boaters to stay at least 200 yards off shore to prevent disturbance. To promote awareness in these areas, signage is posted on some of the NWR sites, and most nautical charts have NWR written on the site or general area. For rocks and reefs that are too small or only exposed at low tide, no specific indication exists. Enforcement of these guidelines has only been undertaken opportunistically by federal and state enforcement agents when they've been patrolling for other purposes.

Since 1997, the Whale Museum has assisted the U.S. Fish & Wildlife Service in promoting these guidelines by providing posted information and brochures at marinas, marine parks and visitor areas likely to reach vessel-based recreationists and commercial eco-tourism operators in San Juan County. In addition, The Whale Museum's Soundwatch Program has operated seasonal educational patrols that contact boaters in the vicinity of the refuges. The patrol boat also participates in wildlife inventories at the sites and assists with maintenance of signage (Osborne and others 1998).

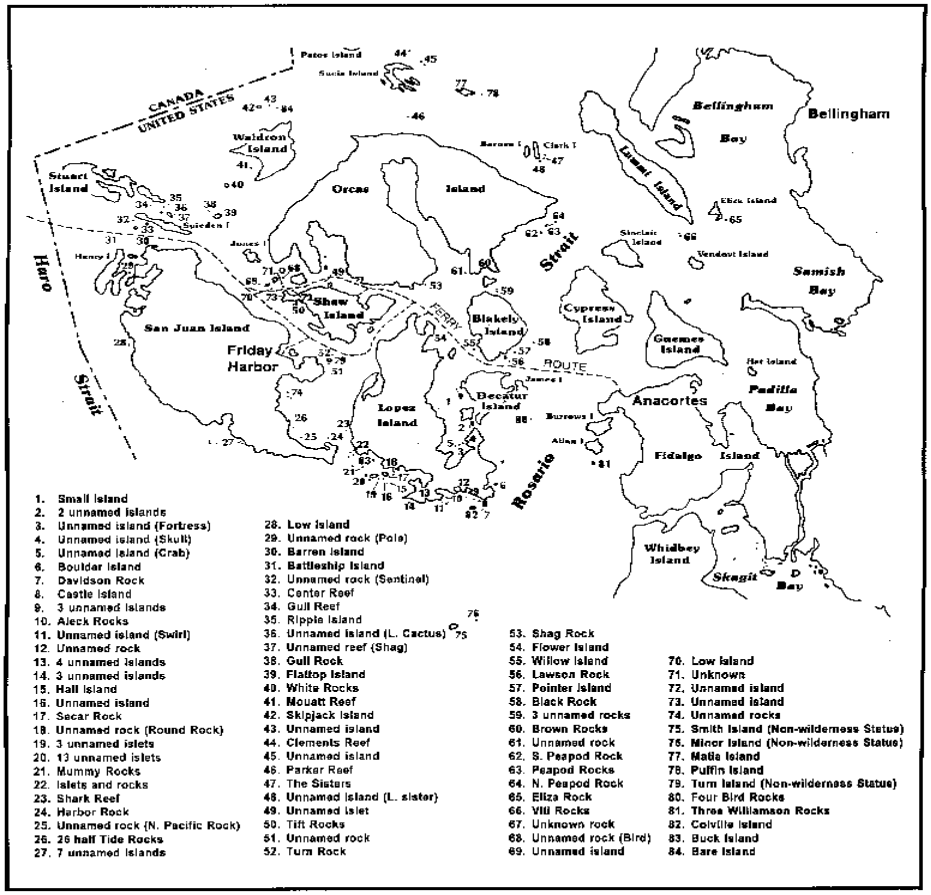

Figure 7. San Juan Islands National Wildlife Refuge and Wilderness Area

Conclusions

Lack of funding for enforcement, civil suits, and legislative inertia are usually the weakest links in regulations that are developed to protect the environment from human activities. The Whale Museum's Soundwatch Program has attempted to circumvent those impediments in the boundary waters of the San Juan/Gulf Islands, by providing an *in situ* presence of professional educators promoting existing regulations and voluntary best practices developed by the community (Osborne and Koski 1997; Osborne and others 1999; 2000). The presence of educational patrol boats fills the enforcement gap, and the voluntary best practices overcome the inertia of legislated regulations, and reduce the likelihood of lawsuits. The vessel patrols also serve as a scientific platform for collecting data on the status of target wildlife, as well as providing a basis for evaluating the effectiveness of management strategies. This type of program makes the environmental educator central to facilitating adaptive management, by fulfilling a critical role at the interface between wildlife, the public, and the strategies of scientists and resource managers so that management can be both responsive and flexible.

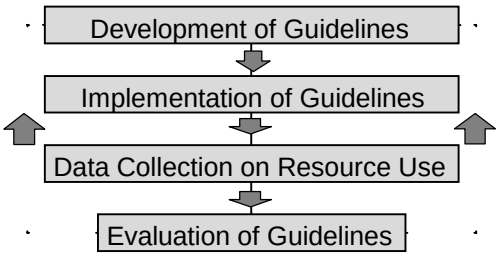

Figure 8. Adaptive Management Using Voluntary Guidelines.

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